

REMARKS

All of the pending claims stand rejected on the basis of both (a) the Chung reference; and (b) the Capote reference. These rejections are respectfully traversed.

The Chung Reference

The outstanding office action first rejects claims 19-26 and 35-38 as being anticipated by Chung. These rejections are respectfully traversed. All of the pending claims specifically require that the underfill adhesive conformally surround the solder bumps in the B-staged state (i.e., prior to reflow). The underfill is applied as a flowable material that surrounds solid solder bumps. (Claim 1 has been amended to further emphasize the application as a flowable material feature). As such, the adhesive conformally surrounds the solid solder bumps. In contrast, the underfill layer described by Chung is applied as a B-staged **preform**. That is, it is formed as a rigid unit **before** it is adhered to the wafer. It should be appreciated that, a preform will **not** conformally surround a solid solder bumps. It is respectfully submitted that applying the underfill as a flowable material is a non-obvious simpler and more efficient approach than attaching a preform to the front of a wafer. In view of the foregoing, it is respectfully submitted that none of the pending claims are disclosed or reasonably suggested by the Chung reference.

The Response to Arguments section of the outstanding Office Action addresses the conformat surrounding of the solder bumps issue as follows:

Please note that Chung teaches the solid perform has a flow characteristic that, under heat and pressure, cause the perform to melt and flow so that it can be cured (*citing Col. 9, lines 6+ and Col. 11, lines 23+*). This would also cause it to conformally surround the solder bumps (*citing Figure 5*). [O.A. pp. 2-3]

Although it is understood and agreed that the perform taught by Chung will conformally surround the solder bumps **when it is cured**, it is respectfully submitted that this does not meet the language of any of the independent claims. Rather, the pending claims all require that the underfill adhesive conformally surround solid solder balls **in the B-staged state**. That is, before the adhesive is reflowed. It is respectfully submitted that the solid B-staged perform taught by Chung is not designed to conformally surround solid solder bumps in its B-staged state as required by the pending claims. In view of the foregoing, it is respectfully submitted that the outstanding rejections based on the Chung reference must be withdrawn for at least this reason. Additionally, it is respectfully submitted that Chung standing alone or in any reasonable combination with the art of record does not reasonably suggest any of the claimed combinations.

The Capote Reference

The outstanding office action also rejects all of the pending claims based as allegedly being obvious in view of the Capote reference. The rejection acknowledges that Capote fails to disclose the use of a B-staged adhesive, but asserts that such a modification would have been obvious to those of ordinary skill in the art. The office action takes the position that since B-stageable adhesives were known (citing the Chung reference as evidence), it would have been obvious to those of ordinary skill in the art to substitute a B-stageable adhesive for the adhesive materials described by Capote to come up with the claimed arrangement. The position is respectfully traversed. It is respectfully submitted that at the time of the present invention, if a person of ordinary skill in the art that was familiar with the Capote reference determined that they wanted to utilize a B-stageable adhesive as the underfill material, they would utilize a B-staged perform, just like Chung did. That is, absent the teaching of the present invention, they would not have been motivated to apply a B-stageable adhesive to the surface of a wafer and B-stage the adhesive, *in situ*, which is effectively what is required by the presently pending claims which require that a B-staged material conformally surround solid solder bumps. It is respectfully submitted that the inability of the Examiner to identify a reference that utilizes a B-staged adhesive in the claimed manner is strong evidence of the non-obviousness of the pending claim set.

Conclusion

In view of the foregoing, it is respectfully submitted that all of the pending claims are patentably distinct from the cited art of record for at least the reasons set forth above.

If any fees are required in connection with the filing of this response, including any fees required for any required extension of time, such fees may be charged to Deposit Account No. 50-4481 (Order No. NSC1P131X1). Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER LAW GROUP LLP

/Steve D Beyer/
Steve D Beyer
Reg. No. 31,234

P.O. Box 1687
Cupertino, CA 95015-1687
408-255-8001